

# COASTAL CONNECTIONS



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C O A S T A L M A N A G E M E N T P R O F I L E



## **Christine Charrier**

**Permit Coordinator,  
Coastal Management  
Division, Louisiana  
Department of Natural  
Resources (DNR)**

**Hometown:** My father was in the Air Force, so I've lived in lots of places. I moved back to Louisiana after high school and now live in Lafayette.

**Family:** Husband Mark and adult stepchildren Sam, 29, and Jessica, 23. Also, I will be a grandmother in a few months. My dad still lives in Lafayette. And I have two dogs—a basset hound mix and a 13-year-old lab that can still chase a tennis ball.

**Education:** B.A. in wildlife management and M.S. in population genetics, both from University of Louisiana–Lafayette.

**Most fulfilling aspect of your job:** I have supervised the creation of a new on-line permitting system, and our customers are really happy with it.

**Most challenging aspect of your job:** Trying to convince

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## **FOCUS**

# MAPPING BENTHIC HABITAT

Sophisticated technologies for mapping coastal- and marine-floor habitat have never been more plentiful—and using these tools to gather benthic habitat data has never been more important.

In recent decades, coastal and marine habitat mapping has increasingly been recognized as a useful tool in determining resource mitigation and management strategies. Advances in mapping technologies now provide coastal resource managers with detailed information on the geological, biological, oceanographic, and chemical components of the marine floor.

Rapid coastal development is one factor driving the need to establish accurate baseline data of the benthic environment. The National Oceanic and Atmospheric Administration (NOAA) National Ocean Service found that 23 of the 25 most densely populated U.S. counties in 2003 were located on the coast ("Population Trends along the Coastal United States: 1980–2008").

"Mapping benthic habitat is very important in these coastal areas," says Bill Stevenson, a marine scientist with the NOAA Coastal Services Center. "People move to the coast partly to enjoy natural resources, but as growing communities extract more and more freshwater from rivers that feed estuaries, they impact estuarine species and other aspects of the benthic habitat. By mapping the marine floor, we can monitor changes and mitigate some of the factors driving habitat change."

Climate change is another probable influence on marine habitat alterations, according to a 2007 report from Working Group II of the Intergovernmental Panel on Climate Change (IPCC). (These reports can be found at [www.ipcc.ch](http://www.ipcc.ch).) The IPCC report notes that climate change is a likely factor in the observed acidification of the ocean, shifts in algal and plankton populations, earlier migrations of river-dwelling fish, decreased freshwater due to saltwater intrusion, and other elements with potential to affect benthic habitat.

## **Benthic Mapping Uses and Technologies**

Maps can provide valuable information in a wide variety of contexts:

- Determining navigation- and hazards-related information
- Compiling inventories of marine resources and habitats
- Assessing damage and determining mitigation strategies
- Surveying pipeline and cable routes
- Developing marine protected area boundaries
- Assembling detailed species inventories
- Recording historical erosion and deposition data

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people who are comfortable with the old permitting system to do it a new way.

**Work-related accomplishment that makes you proud:** It takes a natural diplomacy to help applicants develop the most environmentally sound projects, while also making sure everybody's needs are met.

**Personal accomplishment that makes you proud:** Having a happy family.

**Things you do in your spare time:** I like camping, fishing, and road trips. Mark and I are in a pool player's league, and I've played national pool tournaments in Las Vegas.

Louisiana DNR's new on-line permitting system, which Christine Charrier helped bring into being, is a big hit with customers. "With real-time tracking and electronic notification, we've cut out a week or more of mail time in the permitting process," says Charrier. "Our customers prefer to fill out the permit form and click a button, rather than making multiple copies and sending documents through FedEx."

As soon as a permitting document in Louisiana is completed, anyone can go on-line to view it or comment upon it. Customers can choose to view permits by year, applicant name, or parish. "Another advantage with the on-line process is that applicants can find out immediately what agencies or the public think about their permits, so they can start addressing any concerns right away," notes Charrier.

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However, a successful project can occur only when the mapping technology is well-suited to the program and ecosystem. Bringing about that state of affairs requires managers to do their homework on the following mapping technologies:

- Aerial photo and satellite technologies
- Acoustic sensor technologies that include single-beam sonar, side-scan sonar, and multi-beam sonar
- Video technologies that include hand-held video and video transects
- Sediment sampling that includes sediment profile imaging, sediment grabs, and sediment cores

"Some, but not all, benthic habitat mapping projects are expensive undertakings, and it's worth your while to thoroughly research all of the factors affecting cost before you select your methods or technologies," says Mark Finkbeiner, a marine scientist with the Center.

According to Finkbeiner, major elements affecting project costs include the size of your desired mapping area, your desired level of mapping detail and accuracy, the cost of each mapping technology, the unique environmental conditions of your area, and the number of work hours needed to complete the project.

### **Layering the Data for Comprehensive Analysis**

While some coastal resource managers use one or two mapping technologies, it is more common to employ several mapping strategies during the course of a project.

Projects completed in Apalachicola Bay, Florida,

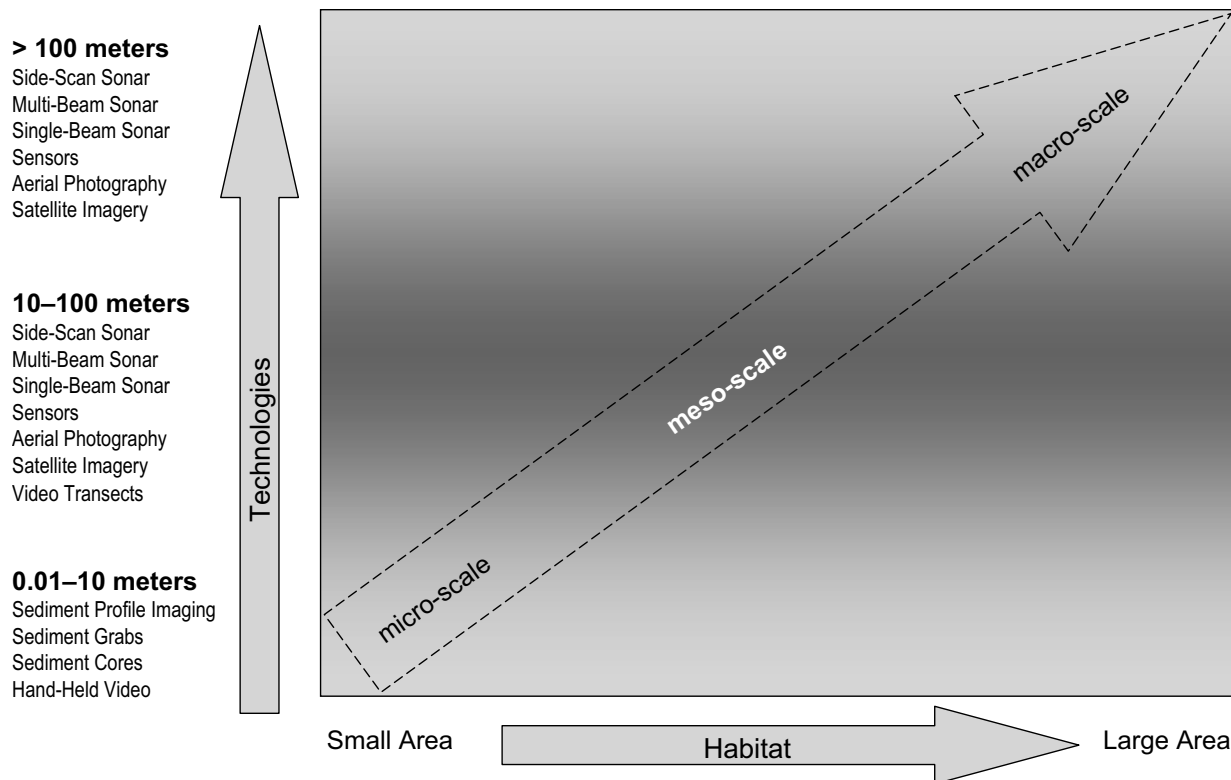
illustrate the importance of "overlapping" multiple sources of data to obtain the most accurate, useful map. The Center recently partnered with the Apalachicola National Estuarine Research Reserve (NERR) and the U.S. Geological Survey (USGS), completing the second of two projects to map benthic habitat in the bay. This study identified oyster habitat.

"We had to have a more accurate map of oyster habitat, because some water-diversion projects now taking place have the potential to affect the bay's sediment, salinity, and other factors important for the oyster population," says Lee Edmiston, research coordinator with Apalachicola NERR. "Oyster harvesting is a very important part of our local and state economy—90 percent of Florida oysters come out of Apalachicola Bay."

Each technology had advantages and disadvantages. "We explored using aerial photography, but our ability to visualize some oyster habitat was hampered by the turbid water," says Stevenson. "That is where the USGS came in—they had the side-scan sonar equipment and expertise that worked effectively in the bay's shallow and turbid waters. We also used autonomous surface vehicles, which are essentially small boats with Global Positioning System (GPS) and acoustic sensors that can float in about three feet of water."

Still more work was needed. "Some of our oyster reefs are covered with sediment, so we towed an underwater video camera along the bay bottom, which gave us a truer picture of the habitat," says Edmiston. "We also needed sediment samples to ground-truth the data. All of these technologies, when taken together, gave us valuable information."

## Habitat Scale Considerations



When choosing the best methods of benthic data collection and visualization, think about the size of the biological community or geographic feature you intend to capture. Detailed features in small areas measuring 0.01 to 10 meters are often best captured with the micro-scale tools noted here. By contrast, less detailed features in larger areas encompassing more than 100 meters are often best captured with the macro-scale tools listed.

## Benthic Habitat Mapping Resources

To learn more about benthic habitat mapping, visit the Center Web site at [www.csc.noaa.gov/benthic/](http://www.csc.noaa.gov/benthic/). Several Center projects and products are highlighted below:

### PROJECTS

- NOAA is working with the Texas Parks and Wildlife Department and the Texas A&M University Center for Coastal Studies to support the statewide seagrass monitoring program.
- NOAA, joined by NatureServe and other organizations, is beginning to develop mapping guidance for the national Coastal and Marine Ecological Classification Standard (CMECS). CMECS provides a consistent framework for classifying benthic and water-column habitats from the estuarine environment out to deep ocean waters.

### PRODUCTS

- "Guidance for Benthic Habitat Mapping: An Aerial Photographic Approach" provides useful tips and standardized methodology for seagrass data developers.
- A CD-ROM titled "Submerged Aquatic Vegetation (SAV): Data Development and Applied Uses" includes technical mapping guidance, information about seagrasses, and SAV data and mapping examples.

*Coastal Connections* is a publication of the National Oceanic and Atmospheric Administration Coastal Services Center, produced for the coastal resource management community. Each issue of this free bimonthly newsletter focuses on a tool, information resource, or methodology of interest to the nation's coastal resource managers.

Please send us your questions and suggestions for future editions. To subscribe or contribute to the newsletter, contact our editors at

*Coastal Connections*  
NOAA Coastal Services Center  
2234 South Hobson Avenue  
Charleston, South Carolina 29405  
(843) 740-1200  
[CoastalConnections@noaa.gov](mailto:CoastalConnections@noaa.gov)  
[www.csc.noaa.gov/newsletter/](http://www.csc.noaa.gov/newsletter/)

**Editor:**

Kitty Fahey

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## NEWS AND NOTES

### On-line Career Resource Debuts

Restore America's Estuaries has launched the Restoration Job Board, an on-line employment site targeted at professionals in coastal and estuarine habitat restoration. The job board helps streamline the hiring process with tools for quick job posting, resume searching, and job-seeker tracking. To learn more, visit <http://jobs.restorationmarketplace.com>.

### Mississippi DMR Staff Saluted for Historic Preservation Efforts

The Mississippi Heritage Trust recently recognized staff members at the Mississippi Department of Marine Resources (DMR) for their efforts to document and save historic sites in the aftermath of Hurricane Katrina. Personnel in the agency's Comprehensive Resource Management Plan division were also credited with the successful effort to designate the Mississippi Gulf Coast a National Heritage Area following Katrina. The Mississippi DMR Web site is [www.dmr.state.ms.us](http://www.dmr.state.ms.us).

### Proposals Sought for NOAA Special Project and Program Funding

NOAA is seeking proposals for the fiscal year 2007 Broad Agency Announcement Request for Extramural Research, Innovative Projects, and Sponsorships—special projects and programs associated with NOAA's strategic plan and mission goals. Proposals will be accepted until September 28. For more information, see [www.grants.gov/search/search.do?oppld=12665&mode=VIEW](http://www.grants.gov/search/search.do?oppld=12665&mode=VIEW).

### Transitions

**C.W. "Rocky" Browder III**, formerly regional permit administrator for the South Carolina Office of Ocean and Coastal Resource Management, has left the agency... **James Byrne**, a NOAA Coastal Fellow with the Guam Coastal Management Program from 2002 to 2004, is now science director for the Southeast Caribbean Program of the Nature Conservancy... **Victor Somme** and **Bill Rohring**, respectively the former director and assistant director of the U.S. Virgin Islands' Division of Coastal Zone Management, have left the agency... **Megan Higgins** has been hired as research counsel by the Rhode Island Sea Grant Legal Program.

NOAA Coastal Services Center  
2234 South Hobson Avenue  
Charleston, South Carolina 29405

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